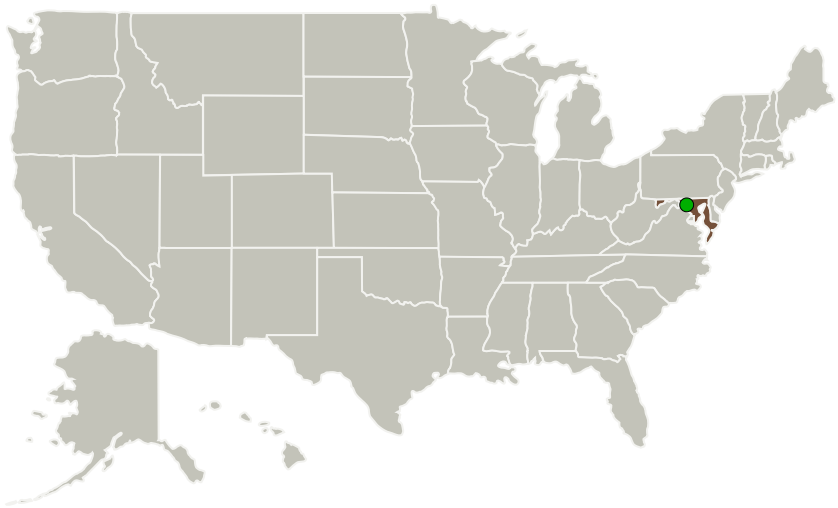
Advanced Microshutters for UV and Visible Astronomy from Space

Completed Technology Project (2014 - 2017)

Project Introduction

We propose to extend the development of Next Generation of Microshutter array (NGMSA), producing a scalable, electrically operable arrays that will be suitable for flight applications. Providing high contrast (>=10,000), the microshutter array is the only solution for multi-object selection for space telescopes for UV spectroscopy, and can be a powerful tool for visible astronomy. The microshutter arrays developed for James Webb Space Telescope (JWST MSA) are magnetically actuated, providing 100 times of increase in instrument efficiency over single slit object selection, but cannot practically be scaled to the larger sizes required for future missions. Our NGMSAs are electrially actuated, allowing much simpler operation which open a path to large scale mosaics that are required for many proposed missions. A NGMSA mosaic can cover such a large field of view, providing a factor of 5000 increase in instrument efficiency over single slit instruments for redshift surveys. We are in the third year of an APRA-funded program for the basic development of these devices. We have successfully reached the proposed project milestone: we have demonstrated NGMSA 2-dimensional electrical addressing, opening the path to large arrays. PIs of three Explorer-Class mission concepts plan to include NGMSA as their multi-objector selector in their proposals following successful demonstration at full format. The extension of the NGMSA project will allow us to advance the technology to high TRL levels to be ready for these flight missions. We suggest the following reviewers for this effort: Chris Martin (Caltech), James Green (University of Colorado, Boulder), and Oswald Siegmund (University of California, Berkeley).

Primary U.S. Work Locations and Key Partners



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Organizational Responsibility

Responsible Mission Directorate:

Science Mission Directorate (SMD)

Responsible Program:

Astrophysics Research and Analysis

Advanced Microshutters for UV and Visible Astronomy from Space

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Organizations Performing Work	Role	Type	Location
Goddard Space Flight Center(GSFC)	Supporting Organization	NASA Center	Greenbelt, Maryland

Primary U.S. Work Locations
Maryland

Project Management

Program Director:

Michael A Garcia

Program Manager:

Dominic J Benford

Principal Investigator:

Samuel H Moseley

Co-Investigators:

Mary J Li
Alexander S Kutyrev
Devin E Burns
Sara R Heap
Keith Redwine
Stephan R Mccandliss

Technology Areas

Primary:

- TX08 Sensors and Instruments
  - TX08.1 Remote Sensing Instruments/Sensors
    - TX08.1.1 Detectors and Focal Planes

Target Destination

Outside the Solar System